

REMARKS

This Response is submitted in reply to the Non-Final Office Action dated January Jun 11, 2010. In light of the following remarks, pending claims 1 and 3-28 should be allowed. Reconsideration and notice to that effect are respectfully requested.

Rejections under 35 U.S.C. §103

In the Office Action, claims 1, 3-28 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pat. 5,909,057 to McCormick et al in view of U.S. Pat. 5,881,945 to Edwards et al. Claims 1, 3, 15, 20 and 25 recite a heat spreader construction or an integrated circuitry including a base portion formed from one of a list of materials and a frame portion formed from one of a list of materials, where the material forming the frame portion is different from the material forming the base portion.

The Office Action concedes that McCormick et al. do not disclose, suggest or teach a base portion and a frame portion made of different materials because the heat spreader is a single piece spreader formed from nickel plated copper. However, the Office Action asserts that McCormick discloses a heat spreader formed from two materials and that it would have been obvious as the time of the invention for a person of ordinary skill in the art to modify McCormick with a heat spreader formed from two different components as disclosed in Edwards. Applicants respectfully disagree because there would have been no reasonable basis to make the modification proposed in the Office Action and because the result combination does not teach, disclose or suggest the claimed invention.

McCormick expressly discloses a *single-piece* heat spreader (Abstract). This single piece spreader is reportedly an improvement over prior art spreaders that include a separate stiffener component requiring two bonding steps (Col. 3, Lines 35-40). Moreover, the single piece is formed from a high modulus, high thermal conductivity material such that it can better withstand expansion forces when heated (Col. 3, lines 40-60). Edwards, in contrast, discloses a two-part component that utilizes a multi-layer sealing band formed from at least two solder materials. These materials utilize lower melting point solders and, unlike the single piece spreader of McCormick that resists expansion, the solder layers provide for a higher tolerance for expansion (Col. 11, lines 5-12).

A person of ordinary skill in the art would have no basis to modify McCormick from a one-piece assembly to a two piece assemble as disclosed in Edwards. First, McCormick specifically teaches away from prior art two component heat spreaders in favor of a one component spreader. Second, the solder materials reported in Edwards do not possess high thermal conductivity characteristics as required by McCormick, and so it does not appear that the solder layers disclose in Edwards would possess sufficient thermal characteristics to prevent thermal expansion issues. Indeed, Edwards actually discloses that the use of the solder layers allows the cap portion of the spreader to be formed from a lower cost material because of the tolerances incorporated into the solder layers (Col. 11, lines 25-30). This is the exact opposite approach of the configuration disclosed in McCormick.

Even if these references are combined, the combination does not disclose each limitation of the independent claims. Each independent claim recites a group of materials that the frame portion may be formed from. However, Edwards fails to disclose the use of any of these materials for the solder layers. Instead, Edwards discloses the use of various tin, lead, indium and bismuth solder materials, none of which are claimed in the present invention. Moreover, Edwards discloses that the selection of solder materials in the layers is critical to performance. As such, Edwards does not disclose or suggest a broad range of materials that could encompass the scope of the claimed subject matter, but rather focuses on a particular solder materials with particular thermal properties. Withdrawal of this rejection is respectfully requested.

Conclusion

All of the claims in this application are in condition for allowance. A prompt notice to that effect is respectfully solicited. If there are any remaining questions, the Examiner is requested to contact the undersigned at the number listed below.

Respectfully submitted,

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